CLAIMS

1. A recording medium used for storing data, said recording medium comprising:

a digital stream constituted by multiplexing a video stream and a graphics stream, wherein said video stream represents a moving picture made of a plurality of pictures, and the graphics stream includes:

graphics data representing graphics to be combined with the pictures; and

window information that specifies a window for rendering the graphics therein, the window information indicating a width, a height and a position of the window on a plane, the plane being a plane memory of a reproduction apparatus that combines the graphics with the pictures.

2. A recording medium according to Claim 1, wherein the width and height of the window are set so that a size of the window is 1/x of the plane, the plane corresponding to a size of each picture and x being a real number based on a ratio between a window update rate and a picture display rate.

3. A recording medium according to Claim 1, wherein:

the graphics stream includes control information that contains crop information specifying a cropping frame within a graphics object obtained by decoding the graphics data; and

the graphics to be rendered in the window is a part of the graphics object within the cropping frame.

4. A recording medium according to Claim 3, wherein the control information contains position information specifying a position in the window for rendering the part of the graphics object within the cropping frame.

5. A recording medium according to Claim 4, wherein:

the graphics stream includes a plurality of pieces of control information for realizing one of scroll, wipe-in, wipe-out, cut-in, and cut-out display effects; and

each of the pieces of control information includes the crop information and the position information that respectively specify a different cropping frame and a position.

6. A reproduction apparatus used for reproducing a digital stream constituted by multiplexing a video stream and a graphics stream, said reproduction apparatus comprising:

a video decoder operable to decode the video stream so as to obtain a moving picture made of a plurality of pictures;

a graphics decoder operable to render graphics so as to be synchronously displayed with the pictures; and

a plane memory corresponding to a plane and being used for combining the graphics with the pictures, wherein:

the graphics stream includes window information that specifies a part of the plane as a window for rendering the graphics therein; and

the rendering of the graphics by said graphics decoder includes a clearing of the graphics in the window in said plane memory, and a writing of the graphics to the window in said plane memory.

7. A reproduction apparatus according to Claim 6, wherein:

the graphics stream includes compressed graphics data; and

said graphics decoder includes a processor operable to decode the compressed graphics data, and a controlling unit operable to perform the clearing operation and the writing operation.

8. A reproduction apparatus according to Claim 7, wherein:

a size of the window is set so as to be 1/x of the plane, x being a real number based on a ratio between a window update rate and a display rate of the video stream; and

the writing operation performed by said controlling unit is performed at a transfer rate based on the update rate of the window and the size of the window.

9. A reproduction apparatus according to Claim 7, wherein:

said graphics decoder includes an object buffer operable to store decompressed graphics data decoded by said processor;

the graphics stream includes control information that contains crop information specifying a cropping frame within a graphics object obtained by decoding the graphics data in the object buffer;

said controlling unit is operable to crop a part of the graphics object within the cropping frame; and

the graphics to be synchronously displayed with the pictures is the part of the graphics object within the cropping frame.

10. A reproduction apparatus according to Claim 9, wherein:

the control information contains position information

specifying a position in the window for rendering the part within the cropping frame; and

the part within the cropping frame is written to the window at the position specified by the position information.

11. A reproduction apparatus according to Claim 10, wherein:

the graphics stream includes a plurality of pieces of control information;

the crop part and the position indicated by the crop information and the position information respectively in each piece of control information are different; and

said controlling unit is operable to realize one of scroll, wipe-in, wipe-out, cut-in, and cut-out display effects by performing the clearing and writing of the graphics based on the crop information and the position information in each piece of control information.

12. A reproduction apparatus according to Claim 6, further comprising two plane memories constituting a double buffer, wherein the graphics is displayed by switching the displayed graphics from contents stored in one of said plane memories in said double buffer to contents stored in the other one of said plane memories.

13. A method of recording onto a recording medium, said method comprising:

producing application data; and

recording the produced application data in the recording medium, wherein:

the application data includes a digital stream constituted

by multiplexing a video stream and a graphics stream;

the video stream represents a moving picture made of a plurality of pictures, and the graphics stream includes:

graphics data representing graphics to be combined with the pictures; and

window information that specifies a window for rendering the graphics therein, the window information indicating a width, a height and a position of the window on a plane, the plane being a plane memory of a reproduction apparatus that combines the graphics with the pictures.

14. A program used for enabling a computer to reproduce a digital stream constituted by multiplexing a video stream and a graphics stream, said program comprising:

code operable to cause the computer to decode the video stream so as to obtain a moving picture made of a plurality of pictures; and

code operable to cause the computer to render graphics so as to be synchronously displayed with the pictures, wherein:

the graphics stream includes window information that specifies a part of the plane as a window for rendering the graphics therein; and

said code operable to cause the computer to render the graphics includes code operable to cause the computer to perform a clearing of the graphics in the window in a plane memory used for combining the graphics with the picture, and a writing of the graphics to the window in the plane memory.

15. A method of reproducing a digital stream constituted by

multiplexing a video stream and a graphics stream, said method comprising:

decoding the video stream so as to obtain a moving picture made of a plurality of pictures; and

rendering graphics so as to be synchronously displayed with the pictures, wherein:

the graphics stream includes window information that specifies a part of the plane as a window for rendering the graphics therein; and

said rendering of the graphics includes a clearing of the graphics in the window in a plane memory used for combining the graphics with the picture, and a writing of the graphics to the window in the plane memory.

16. An integrated circuit used for reproducing a digital stream constituted by multiplexing a video stream and a graphics stream, said integrated circuit comprising:

a video decoder operable to decode the video stream so as to obtain a moving picture made of a plurality of pictures;

a graphics decoder operable to render graphics so as to be synchronously displayed with the pictures; and

a plane memory corresponding to a plane and being used for combining the graphics with the pictures, wherein:

the graphics stream includes window information that specifies a part of the plane as a window for rendering the graphics therein; and

the rendering of the graphics by said graphics decoder includes a clearing of the graphics in the window in the plane memory, and a writing of the graphics to the window in the plane

memory.